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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/129,113	08/04/98	CAMERON J	50349

IM22/0817

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EXAMINER	
GILMORE, B	
ART UNIT	**PAPER NUMBER**
1752	5

DATE MAILED: 08/17/99

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.	Applicant(s)
09/129,113	Cameron et al
Examiner	**Group Art Unit**
Barbara Gilmore	1752

☒ Responsive to communication(s) filed on *application filed on 08/04/98 and IDS filed on 05/28/99* .

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire *3* month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) *1-33* is/are pending in the application.

Of the above, claim(s) *28-30* is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) *1-27 and 31-33* is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐approved ☐disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____ .

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____ .

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). *4*

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

DETAILED ACTION

Election/Restriction

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

   I. Claims 1-27 and 31-33 drawn to a photoresist composition and an article of manufacture comprising the photoresist composition classified in class 430, subclass 270.1.

   II. Claims 28-30, drawn to a method for forming a photoresist relief image, classified in class 430, subclass 306.

2. The inventions are distinct, each from the other because of the following reasons: Inventions I and II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the photoresist composition can be used in a materially different method such as in a method of producing a lithographic printing plate.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Peter F. Corless on August 2, 1999 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-27 and 31-33. Affirmation of this election must be made by applicant in replying to this Office action. Claims 28-30 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-11, 17, 19-21, 25-27 and 31-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohsawa et al.

a. In U.S. Patent No. 5,847,218, Ohsawa et al teach a chemically amplified positive resist composition comprising an organic solvent, an alkali soluble resin and a sulfonium salt having a substituted or unsubstituted arylsulfonate anion wherein each of the substituents of the sulfonium salt is substituted or unsubstituted aromatic group (claims 1 and 4) including phenyl, alkoxyphenyl groups and alkylphenyl groups wherein alkyl group having 1 to 8 carbon atoms are exemplary (column 5, lines 23-57). The substituted aromatic groups may have a substituent at any of o-, m- and p- positions, with p- substituted ones having high molecular crystallinity or symmetry (column 6, lines 20-26). The aryl sulfonate may be substituted with a hydrogen atom, alkyl group or alkoxy group. The alky groups are preferably normal and branched alkyl groups having 1 to 12 carbon atoms and the alkoxy groups are preferably those having 1 to 8 carbon atoms (column 6, lines 27-37). An example of the sulfonium salt and sulfonate anion is given in formula 1c (column 15, lines 11-23). Examples of organic solvent include esters such as propylene glycol monomethyl ether acetate (column 16, lines 25-26). Examples of the alkali soluble resin include polyhydroxystyrene and derivatives thereof. Preferred are those polyhydroxy derivatives wherein hydroxy atoms of some OH groups of polyhydroxystyrene are replaced by acid labile groups and hydroxystyrene copolymers including 1-ethoxyethyl. In column 27, lines 30-34, Ohsawa et al teach coating the composition of examples 1-15 onto a silicon wafer. It is the examiner's position that it would have been *prima facie* obvious to one of ordinary skill in the photosensitive art to make a chemically amplified positive resist composition comprising an propylene glycol monomethyl ether acetate, an alkali soluble resin comprising

acid labile groups and a sulfonium slat having substituted or unsubstituted arylsulfonate anion with reasonable expectation of obtaining a chemically amplified positive resist composition having sufficiently high resolution to comply with a fine patterning technique based on the teachings of Ohsawa et al (column 3, lines 42-49).

8. Claims 1-27 and 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sinta et al in view of Daniels et al and Clecak et al.

a. In U.S. Patent No. 5,731,364, Sinta et al teach a photoresist composition comprising a resin binder and a photoactive component, the photoactive component comprising a plurality of distinct aryl sulfonium photoactivatable compounds (claim 1). The invention provides a photoactive component that includes multiple cation sulfonium photoacitive compound that is a carboxylate or sulfonate salt (column 3, lines 24-38) and when used in either positive acting or negative acting photoresist compositions can exhibit excellent lithographic properties (column 1, lines 56-59). Suitable counter ions are given in column 4, line 28 - column 6, line 51 including alkyl sulfonates such as mesylate, aryl tosylates and halogenated alkyl sulfonates such as triflate. The resin binder has functional groups that impart alkaline aqueous developability to the resist composition. Preferred are resin binders that comprise polar functional groups such as hydroxyl or carboxylate (column 7, line 38 - 50). A substituted ester moiety, taught as a suitable acid liable groups of the resin is described in column 9, lines 23-27. Preferred acid labile moieties are acetate groups including t-butyl acetate groups and acetals and

ketals (column 9, lines 44 - 49). A resist of the invention can be prepared as a coating composition by dissolving the components of the photoresist in a suitable solvent such as propylene glycol monomethyl ether and lactates such as ethyl or methyl lactate (column 11, lines 10-26). Sinta et al further teach that the photoresists may be applied to on a substrate as a liquid coating as in a dry film (column 11, lines 27-32). Sinta et al do not expressly teach substituted triphenylsulfonium salts.

b. In U.S. Patent No. 5,397,685, Daniels et al teach a light sensitive composition comprising a binder that is a mixture of a phenolic resin and a photoactive compound capable of generating a curing catalyst (abstract). Preferred onium photoactive compounds, given in column 4, lines 41-68, include sulfonium complex salts. Specifically, triphenylsulfonium tetrafluoroborate, dimethylphenylsulfonium hexafluorophosphate, tritolysulfonium hexafluorophosphate and 4-butoxyphenyldiphenylsulfonium tetrafluoroborate. With respect to claim 4, it is the examiner's position that it is well known in the photosensitive art to use substituted sulfonium salts as photoacid generators based on the teachings of Daniels et al.

c. In U.S. Patent No. 5,322,765, Clecak et al teach a dry developable photoresist composition which comprise an admixture of a film forming aromatic polymer resin, an acid catalyzable agent, and a radiation degradable acid generating compound (abstract). Preferred acid generators include tri(t-butylphenyl)sulfonium hexafluoroantimonate, tri(t-butyl-phenyl)sulfonium hexafluoroasenate and tri(t-butyl-phenyl)sulfonium triflate (claims 14-19). With respect to claim 8, it is the examiner's position that it is well known in the photosensitive

art to use substituted triphenyl sulfonium salts as photoacid generators based on the teachings of Clecak et al. With respect to claim 9, the teachings of Clecak et al does not include triphenyl sulfonium salts substituted with different groups however, the examiner also asserts that it would have been a matter of design choice for one of ordinary skill in the photosensitive art to use a triphenyl sulfonium salt substituted wherein only one phenyl group is substituted. Further the examiner asserts that para substitution of the triarylsulfonium salt would have been obvious to one of ordinary skill in the art due to sulfur's ortho, para directing characteristics (claim 10).

d. Therefore it is the examiner's position that it would have been *prima facie* obvious to make a photoresist composition comprising a binder resin with acid labile groups, a solvent such as propylene glycol monomethyl ether acetate and a photoacid generator such as 4-butoxyphenyldiphenylsulfonium tetrafluoroborate or tri(t-butyl-phenyl)sulfonium triflate wherein the sulfonium salt may comprise a sulfonate as a counter ion with reasonable expectation of obtaining excellent lithographic properties based on the teachings of Sinta et al in view of Daniels et al and Clecak et al.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. In U.S. Patent No. 5,296,332, Sachdev et al teach high sensitivity, high contrast, heat-stable resist compositions comprising a film-forming polymer, an acid crosslinking agent

and a photoacid generator. The compositions are aqueous base developable (abstract). In column 6, lines 12-25 well known triarylsufonium metalate salts including tri(t-butylphenyl)sulfonium triflate as well as the corresponding tosylates and benzene sulfonates are given as suitable photoacid generators.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara Gilmore whose telephone number is (703) 305-1330. The examiner can normally be reached on Monday through Thursday from 7:30 AM to 5:00 PM. The examiner can also be reached on alternate Fridays.

a. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet Baxter, can be reached on (703) 308-2303. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3599.

b. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

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August 16, 1999

Janet Baxter
Supervisory Patent Examiner
Technology Center 1700